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From: Kevin G. Mierzwa

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of In re Application of:

Joseph Robert Brown — Group Art Unit: 2644

Serial Number: 10/065,006 — Examiner: Lee, Ping

Filed: 09/09/2002

For: AUDIO NOISE CANCELLATION SYSTEM FOR A SENSOR IN AN AUTOMOTIVE VEHICLE

Attorney Docket No: 201-0659 (FGT 1637 PA)

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. § 1.8(a))

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Date: 6-27-2005 — Kevin G. Mierzwa

BRIEF ON APPEAL

Mail Stop Appeal Brief – Patents
Commissioner for Patents
Box 1450
Alexandria, VA 22313-1450

Sir:

The following Appeal Brief is submitted pursuant to the Notice of Non-Compliant Appeal Brief dated June 15, 2005.

I. Real Party in Interest

The real party in interest in this matter is Ford Global Technologies, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

II. Related Appeals and Interferences

There are no other known appeals or interferences which will directly affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of the Claims

Claims 1-20 stand rejected in the Final Office Action. A copy of the claims on appeal is attached as an Appendix.

IV. Status of Amendments Filed After Final

There have been no amendments filed subsequent to the final rejection.

V. Summary of the Invention

In certain automotive applications a speaker such as a subwoofer may need to be packaged near a sensor. The output of the speaker and, in particular, the output of a subwoofer is a low frequency, high-power signal that generates acoustic energy that may affect the output of the sensor. The output of the sensor may vibrate or move in response to the output of the subwoofer. Using a microphone is one way to solve the problem. However, in the typically limited space provided in automotive applications the additional component (microphone) may be difficult to place. The claims of the present application solve the problem without the use of an additional component such as a microphone.

Paragraphs 16 and 17 and figure 1 illustrate the circuit of the present invention. Claim 1 recites a compensation circuit 12 for a sensor 22 that generates an electrical sensor output positioned near a speaker of an audio system 16 wherein the electrical sensor output is altered by the acoustics of the speaker 18. An inverting circuit 26 is electrically coupled to an output of the audio system 16. The inverting circuit 26 generates an inverted electrical signal

corresponding to the speaker audio output. A sensor controller 24 coupled to the inverting circuit 26 and the sensor 22 generates a compensated electrical output in response to the electrical sensor output and the inverted electrical signal. The compensated electrical output signal is corrected for the alterations by the acoustics of the speaker.

Independent Claim 8 is similar to Claim 1 with the sensor and the speaker claimed in the system. The wording of the inverting circuit and the sensor controller are the same as that set forth above in Claim 1.

Claim 15 is an independent claim and recites the method for compensating for an electrical output of a sensor. The steps merely correspond to the operation of the circuit described in Claim 1.

VI. Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal:

Whether Claims 1, 3, 6, 8, 9, 14, 15, and 18-20 are anticipated under 35 U.S.C. §102(b) over *Oh* (5,633,936).

Whether Claims 1 and 8 are anticipated under 35 U.S.C. §102(e) by *Nemirovski* (6,671,379).

Whether Claims 5, 11 and 17 are obvious under 35 U.S.C. §103(a) as being unpatentable over *Oh* in view of *Virdee* (5,473,686).

Whether Claims 4, 10 and 16 are obvious under 35 U.S.C. §103(a) as being unpatentable over *Oh* in view of *Sremac* (6,002,761).

Whether Claims 2, 7, 12 and 13 are obvious under 35 U.S.C. §103(a) as being unpatentable over *Nemirovski* in view of *Burns (Principles of Electronics)*.

VII. Argument

The Rejection of Claims 1, 3, 6, 8, 9,14, 15, and 18-20 with respect to *Oh*

Claim 1

Claim 1 has been amended to emphasize that the electrical sensor output is a signal that is altered by the acoustics of the speaker. That is, the vibration caused by the speakers may vibrate the sensor and cause the output signal to be different than that of a sensor in a position other than near a speaker. The background of the invention describes a system that uses a microphone that receives signals from the speaker and converts the signals

to electrical signals. Appellant submits that such systems are similar to that of the *Nemirovski* and the *Oh* references. As recited in the last paragraph of the detailed description of the present application, "Advantageously, the present invention does not rely on the positioning of a microphone or other transducer device directly adjacent to the speaker. Thus, for automotive applications increased flexibility is achieved in applying the compensation circuit of the present invention." That is, because a microphone does not have to be placed, the packaging flexibility of the system is increased.

The *Oh* reference is directed to a system that uses a microphone to receive a near end signal and a far end signal. The high pass filter and sampling circuit are used to determine the near end detection signal which is provided to the adaptive filter 16. The adaptive filter 16 filters out the far end speech signal from the sent-in signal 28. The output signal thus has the far end speech signal removed therefrom. The far end speaker 62 will thus not generate the signal from the near end speaker to provide an echo. Thus, the *Oh* reference fails to teach an electrical sensor positioned near a speaker of an audio system so that the electrical sensor output is altered by acoustics of the speaker. The Examiner points to the microphone as the sensor. The use of a microphone is what the present application is trying to avoid.

Also Appellant submits that no sensor controller is shown. The circuit shown in the *Oh* reference corrects the output of the speaker and not the output of the microphone. In other words, the microphone is an input to the system, not the output. The goal of *Oh* is to prevent the speaker from hearing himself through the speaker 62. More specifically, no sensor controller is shown for "generating a compensated electrical output signal in response to said electrical sensor output and said inverted electrical signal, said compensated electrical output signal corrected for an alteration by the acoustics of the speaker." The *Oh* reference does not correct for the acoustics of the speaker but merely upon the input of the microphone. Appellant respectfully submits that each and every element is not found in the *Oh* reference.

Claim 3

Claim 3 recites that the sensor comprises a pressure sensor. Appellant can find no teaching or suggestion of a pressure sensor in the *Oh* reference. The Examiner points to the microphone as a pressure sensor. Appellant respectfully submits that the microphone is not a pressure sensor. Appellant respectfully submits that each and every element of Claim 3 is not taught in the *Oh* reference and therefore respectfully requests the Board to reverse the Examiner's position.

Claim 6

Claim 6 recites that the sensor controller adds the inverted electrical signal and the electrical sensor output. The *Oh* reference is very different than that of the present application. The *Oh* reference illustrates that the electrical signal to the speaker is inverted at block 18 and added to the microphone circuit. This is different than what is claimed in Claim 6. Appellant therefore respectfully requests the Board to reverse the Examiner's position with respect to Claim 6.

Claim 8

Claim 8 is similar to claim 1 in that the altered electrical sensor output is provided because of the acoustic coupling. Both the *Oh* and the *Nemirovski* references have invented couplings that are received by the microphone. The signal generated from the speaker is used to cancel the electrical signals. Appellant respectfully submits that each and every element of Claim 8 is not taught in the *Oh* reference and therefore respectfully requests the Board to reverse the Examiner's position.

Claims 9 and 14

Claims 9 and 14 are similar to Claims 2 and 6 and are believed to be independently patentable for the same reasons set forth above. Appellant respectfully submits that each and every element of Claims 9 and 14 is not taught in the *Oh* reference and therefore respectfully requests the Board to reverse the Examiner's position.

Claim 15

Claim 15 recites generating electrical signal at an audio system output and electrical input to a speaker. The electrical signal is inverted to form an inverted electrical signal. Claim 15 further recites generating an electrical sensor output signal altered by the acoustics of the speaker and combining the inverted electrical signal and the sensor output signal to form a compensated electrical output. The *Oh* reference does not teach generating an electrical sensor output signal altered by the acoustics of the speaker and combining the inverted electrical signal and the sensor output signal to form a compensated electrical output. Appellant respectfully submits that the microphone 30 is not a sensor according to the present invention. Therefore, the *Oh* reference does not at least include "combining the inverted electrical signal and the sensor output to form a compensated electrical output." The *Oh* reference uses the circuit to cancel the far end speech without canceling or modifying the near

end speech. This is a different goal and therefore different than the elements recited in Claim 15.

Claim 18

Claim 18 recites adding the inverted electrical output to the electrical sensor output. As described above with respect to Claims 6 and 14, Appellant respectfully submits that this is not taught or suggested in the *Oh* reference.

Claim 19

Claim 19 recites that the sensor is a pressure sensor. The *Oh* reference illustrates a microphone and therefore a pressure sensor is not illustrated. Appellant respectfully submits that each and every element of Claim 19 is not taught in the *Oh* reference and therefore respectfully requests the Board to reverse the Examiner's position.

Claim 20

Claim 20 recites generating an electrical signal corresponding to the acoustic signal of the speaker. The *Oh* reference does have an electrical signal corresponding to the acoustic signal of the speaker but does not include the recitations described above with respect to Claim 15. Appellant therefore respectfully request the Board to reverse the Examiner's position with respect to Claim 20 as well.

The Rejection of Claims 1 and 8 with respect to *Nemirovski*

The *Nemirovski* reference is an ear microphone that detects changes in sound to reduce feedback in the system (from the speaker). The *Nemirovski* reference illustrates a microphone that the Examiner describes as a sensor. Appellant respectfully submits that the microphone in this reference as well as the *Oh* reference is not a sensor as set forth in the present invention. Further, the microphone is not altered by the acoustics of the speaker. That is, although the microphone is used to pick up audible signals, the sensor is not an audio sensor; the sensor as described in the present application is an electrical sensor. The *Nemirovski* reference is microphone-based system as described in the background of the present application. Appellant therefore respectfully requests the Examiner to reconsider the rejection of claims 1 and 8 in view of the *Nemirovski* reference in view of the comments set forth above.

The Rejection of Claims 5, 11, and 17 with respect to *Oh* in view of *Virdee*

Claim 5

Claim 5 recites that the inverting circuit comprises a delayed circuit generating a time delay in said inverted electrical signal. The *Virdee* reference is directed to an echo cancelling apparatus. However, the *Virdee* reference also does not teach the elements missing from Claim 5. Appellant respectfully requests the Board to reverse the Examiner's position with respect to Claim 5.

Claim 11

Claim 11 depends from Claim 8 and recites a delay circuit generating a delay in the inverting input. The combination of references fails to teach this in combination with the elements of Claim 8 described above. Therefore, Claim 11 is believed to be allowable.

Claim 17

Claim 17 depends from Claim 15 and recites a delay circuit generating a delay in the inverting input. The combination of references fails to teach this in combination with the elements of Claim 15 described above. Therefore, Claim 17 is believed to be allowable.

The Rejection of Claims 4, 10 and 16 with respect to *Oh* in view of *Sremac*

Claims 4, 10 and 16

Claim 4 recites that the speaker comprises a subwoofer. Claims 10 and 16 also recite the same. Appellant respectfully submits that Claims 4, 10 and 16 are also believed to be allowable for the same reasons set forth above in that the *Oh* reference fails to teach several of the elements in their independent claims. The *Sremac* reference is directed to a multi-line programmable telephone call enunciator. Although Col. 5, lines 1-2, recite a woofer, no teaching or suggestion is provided for a subwoofer. Even so, the *Sremac* reference fails to teach or suggest the elements missing in the *Oh* reference.

The Rejection of Claims 2, 7, 12, and 13 with respect to *Nemirovskl* in view of *Burns*

Claims 2, 7, 12, and 13

Claims 2 and 7, 12 and 13 all recite an operational amplifier. Claims 2 and 12 correspond directly and Claims 7 and 13 correspond directly. The Examiner cites the *Burns*

reference for an operational amplifier. Appellant admits that an operational amplifier is illustrated in the *Burns* reference. However, the *Burns* reference is merely a textbook illustrating an operational amplifier. No teaching or suggestion is provided for the combination of an operational amplifier in combination with the recitations set forth in the *Nemirovski* reference. The Examiner is merely forming a hindsight reconstruction of the invention set forth in Claims 2, 7, 12, and 13. Appellant therefore respectfully request the Board to reverse the Examiner's position with respect to Claims 2, 7, 12, and 13.

VIII. Appendix

A copy of each of the claims involved in this appeal, namely claims 1-20 is attached hereto as Appendix A.

IX. Conclusion

For the foregoing reasons, Appellant respectfully requests that the Board direct the Examiner in charge of this examination to withdraw the rejections.

Please charge any fees required in the filing of this appeal to deposit account 06-1510 or, if there are insufficient funds, to use deposit account 06-1505.

Respectfully submitted,

Kevin G. Mierzwa
Registration No. 38,049
Attorney for Appellants

Date: 6-27-2005

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APPENDIX

1. A compensation circuit for a sensor generating an electrical sensor output positioned near a speaker of an audio system, said electrical sensor output altered by acoustics of the speaker comprising;

an inverting circuit electrically coupled to an electrical output of the audio system, said inverting circuit generating an inverted electrical signal corresponding to a speaker audio output; and

a sensor controller coupled to the inverting circuit and said sensor, said controller generating a compensated electrical output signal in response to said electrical sensor output and said inverted electrical signal, said compensated electrical output signal corrected for an alteration by the acoustics of the speaker.

2. A compensation circuit as recited in claim 1 wherein said inverting circuit comprises an operational amplifier.

3. A compensation circuit as recited in claim 1 wherein said sensor comprises a pressure sensor.

4. A compensation circuit as recited in claim 1 wherein said speaker comprises a subwoofer.

5. A compensation circuit as recited in claim 1 wherein said inverting circuit comprises a delay circuit generating a time delay in said inverted electrical signal.

6. A compensation circuit as recited in claim 1 wherein said sensor controller adds the inverted electrical signal and said electrical sensor output.

7. A compensation circuit as recited in claim 2 wherein said operational amplifier comprises a resistor coupled to an inverting input and an output.

8. A compensation circuit comprising:

a sensor generating an electrical sensor output;

a speaker of an audio system acoustically coupled to said sensor;

an inverting circuit coupled to the electrical output of the speaker, said inverting circuit generating an inverted electrical signal corresponding to a speaker audio output altering the electrical sensor output; and

a sensor controller coupled to the inverting circuit and said sensor, said controller generating a compensated electrical output signal in response to said electrical sensor output and said inverted electrical signal said compensated electrical output signal corrected for an alteration by the acoustics of the speaker.

9. A compensation circuit as recited in claim 8 wherein said sensor comprises a pressure sensor.

10. A compensation circuit as recited in claim 8 wherein said speaker comprises a subwoofer.

11. A compensation circuit as recited in claim 8 wherein said inverting circuit comprises a delay circuit generating a delay in said inverted electrical signal.

12. A compensation circuit as recited in claim 8 wherein said inverting circuit comprises an operational amplifier.

13. A compensation circuit as recited in claim 12 wherein said operational amplifier comprises a resistor coupled to an inverting input and an output.

14. A compensation circuit as recited in claim 8 wherein said sensor controller adds the inverted electrical output and said electrical sensor output.

15. A method for compensating for an electrical output of a sensor comprising:

generating an electrical signal at an audio system output and electrical input to a speaker;

inverting the electrical signal to form an inverted electrical signal;

generating an electrical sensor output signal altered by the acoustics of the speaker; and

combining the inverted electrical signal and sensor output signal to form a compensated electrical output.

16. A method as recited in claim 15 wherein the speaker comprises a subwoofer.

17. A method as recited in claim 15 further comprising generating a delay signal, wherein said inverted signal is formed in response to said delay signal.

18. A method as recited in claim 15 wherein combining comprises adding the inverted electrical output and said electrical sensor output.

19. A method as recited in claim 15 wherein the sensor comprises a pressure sensor.

20. A method as recited in claim 15 wherein generating an electrical signal comprises generating an electrical signal corresponding to the acoustic signal of the speaker.